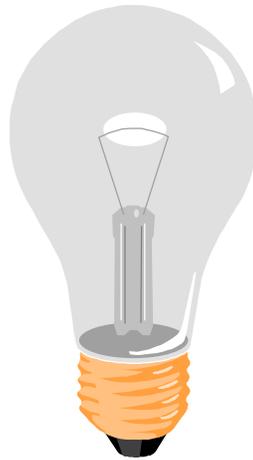


Physics 490
Construction of the Edison bulb



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Purpose:

The purpose of the experiment was to start the construction of the Edison bulb, and to familiarize ourselves with the lab apparatus.

Materials:

1 - Bell jar with stopper	Carbon powder
1 - Vacuum pump with tubing	Cotton thread
1 - Modified light bulb platform	Various wires with alligator clips
Nichrome wire (30 and 26 Gauge)	Power supply

Summary:

From our latest experiment, we have determined many things about creating a light bulb. After testing the apparatus to ensure proper working, we began to construct ideas on how to set up the platform and to run wires to it without losing a good seal. We accomplished this by drilling two holes in the rubber stopper to run lead wires through. To ensure a good seal, the stopper around the wires was saturated with silicon and let out over night to cure. We also need to modify the platform to fit in the bell jar. We did this by cutting a 2.5" square out of .5" thick plywood. We then transferred the socket from the old platform to the new base.

The bell jar was then set up along with the vacuum pump and the modified platform in the optics lab. Alligator clips were used to connect the lead wires to the platform which were then wrapped in electrical tape. The filaments were then made out of certain lengths of 26ga and 30ga nichrome wire, some of which were coiled and some straight. Also, we rubbed carbon onto a thread. The first attempt, we used a straight 30 gauge nichrome wire. We melted this in under 2 seconds. Then, we did it again. After that, we tried to use a 26 gauge straight nichrome wire. This, as well a loop of 26 gauge nichrome wire, melted the wires inside of the light bulb socket. We suppose that the makers of light bulbs create them that way, so that people like us don't do what we are doing. Also, the thread with carbon smeared on it would not light. However, the

coiled 30 gauge wire gave off a satisfactory glow. We even got a good picture with it. Interestingly enough, after a few minutes of this filament burning, the stopper popped out due to the heat generated. We found that the heat had expanded the little bit of air that remained in the bell jar. In future trials, we will progressively remove air while the filament is burning. Along with this change, we will use a thermometer and pressure gauge to measure the conditions under which the light bulb will be operated.